SWAN™ Training
Design and Analysis Examples

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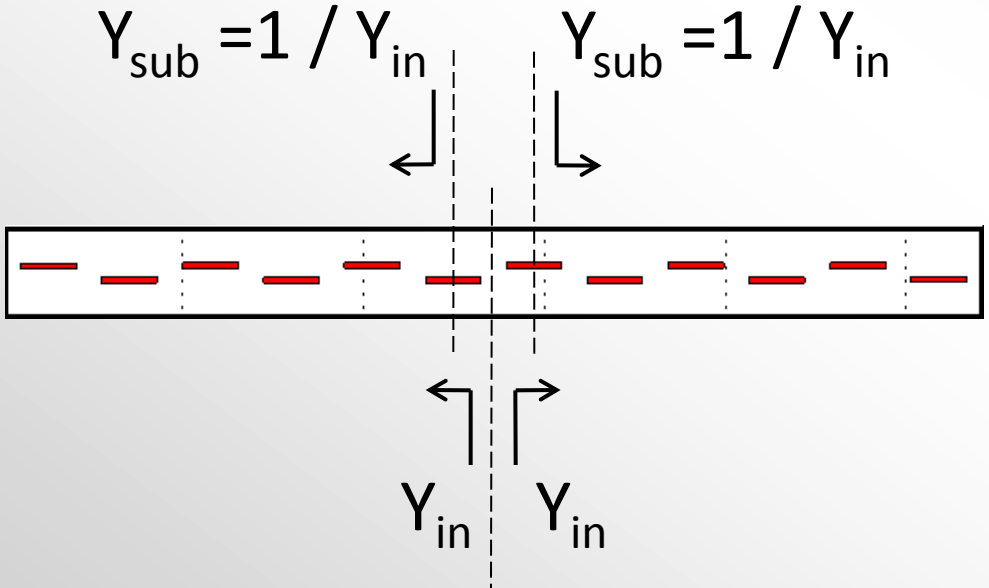
Example 1: The concept of overloading (1)

Problem: bandwidth enlargement

Solution:

- Reduced number of slots for each section
- Centre feeding
- Overloading
- Mismatching a centre frequency



12×1, WR90,
f_0=9.375GHz

Example 1: The concept of overloading (2)

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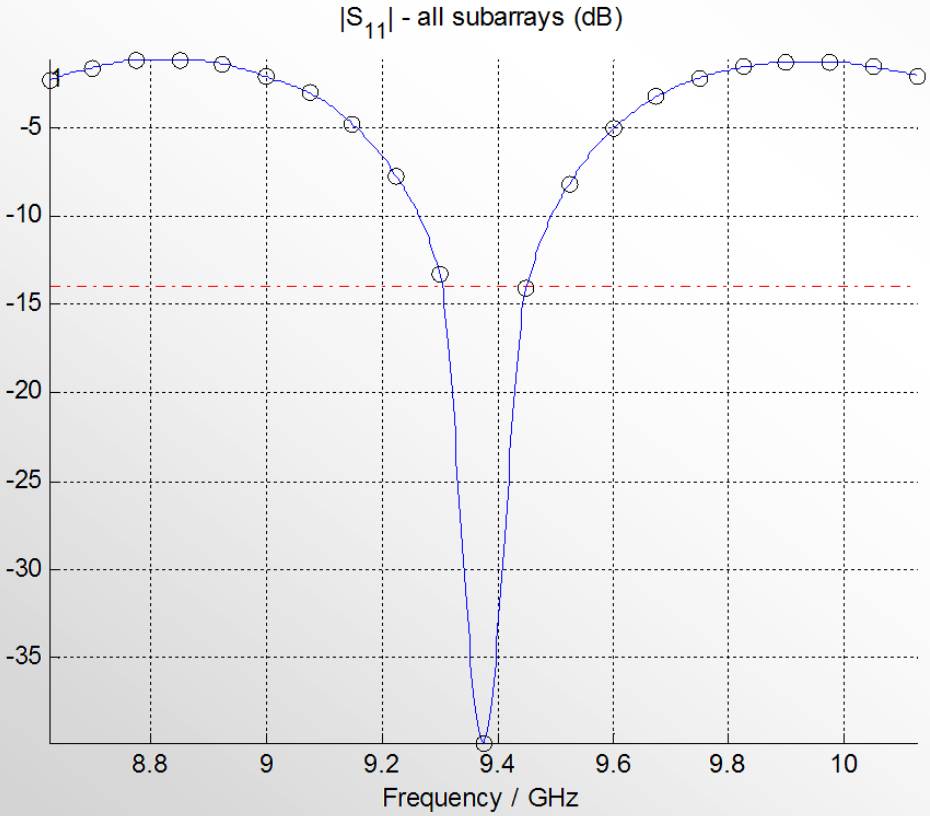
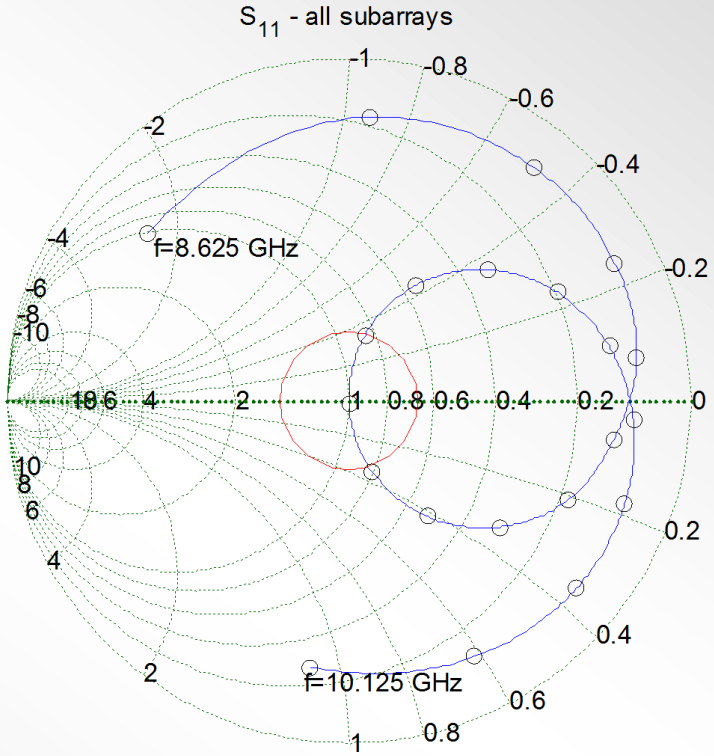
DESIGN

$Y_{in}=2.0$ → $Y_{sub}=0.5$

ANALYSIS

$Y_{in}=2.0$





Example 1: The concept of overloading (3)

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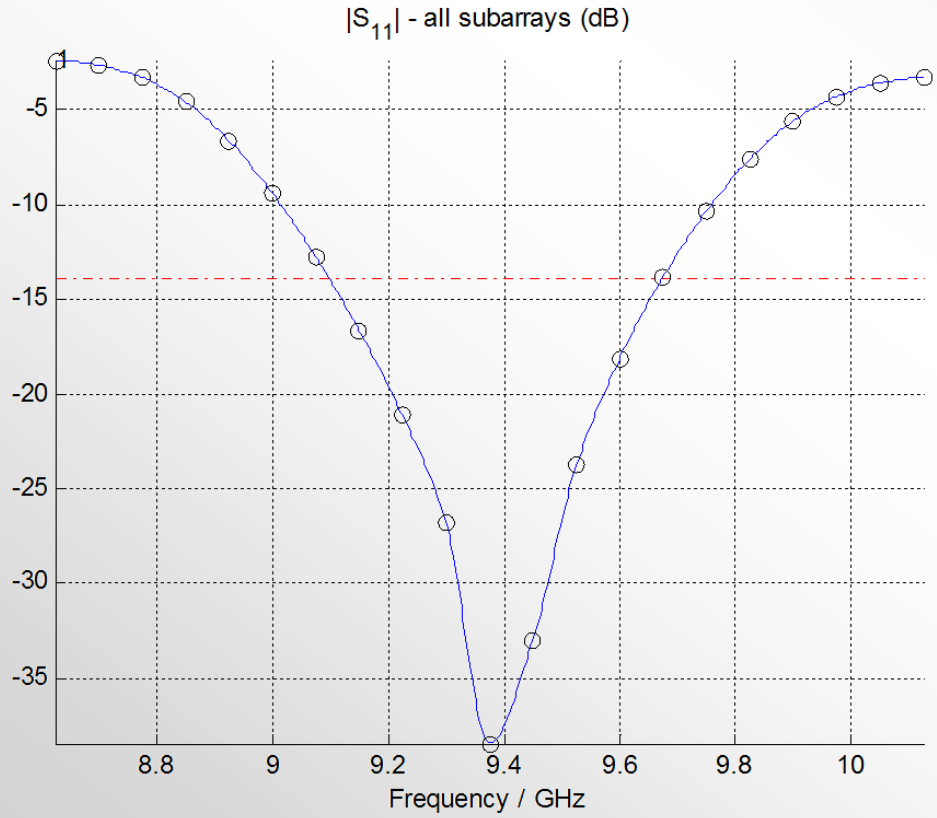
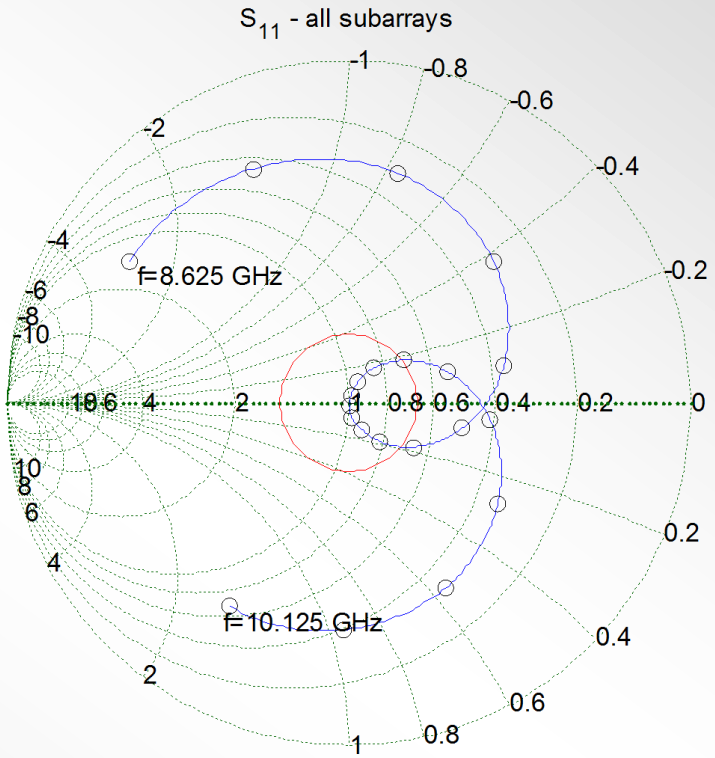
DESIGN

$Y_{in}=1.0$ → $Y_{sub}=1.0$

ANALYSIS

$Y_{in}=1.0$





Example 1: The concept of overloading (4)

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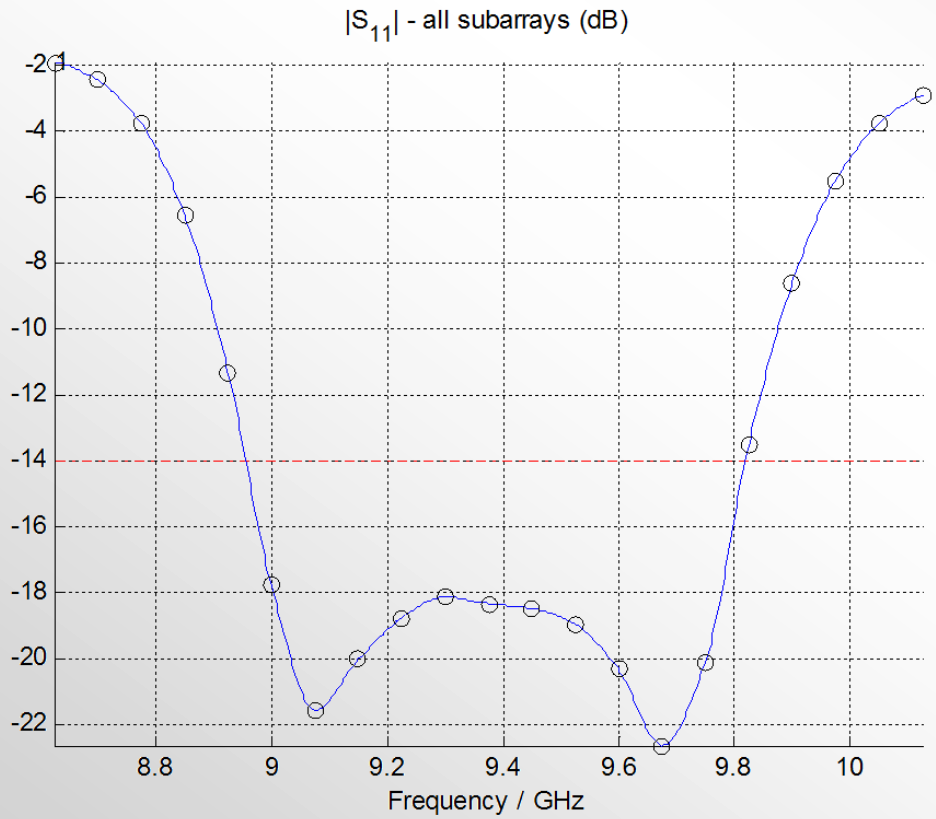
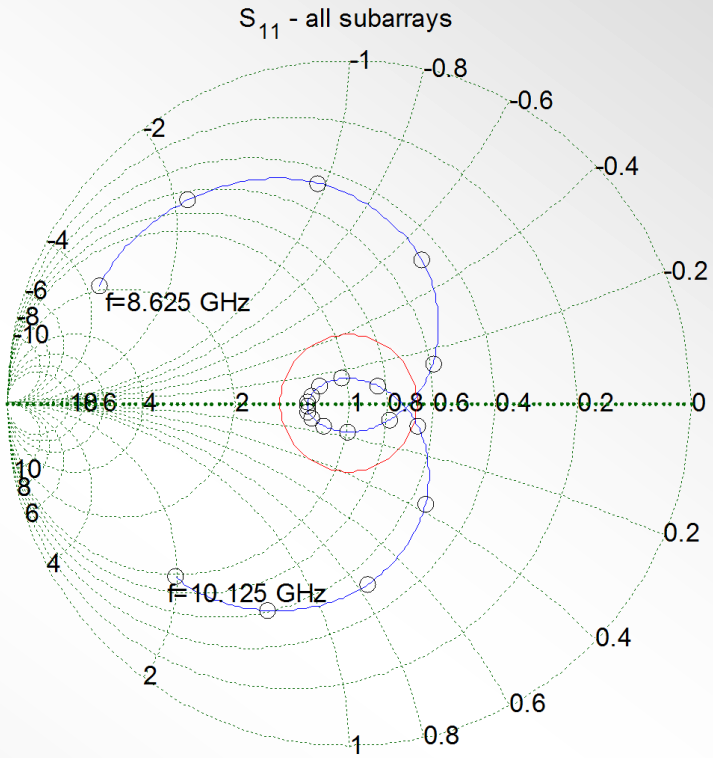
DESIGN

$Y_{in}=0.9$ → $Y_{sub}=1.111$

ANALYSIS

$Y_{in}=0.7$





Example 1: The concept of overloading (5)

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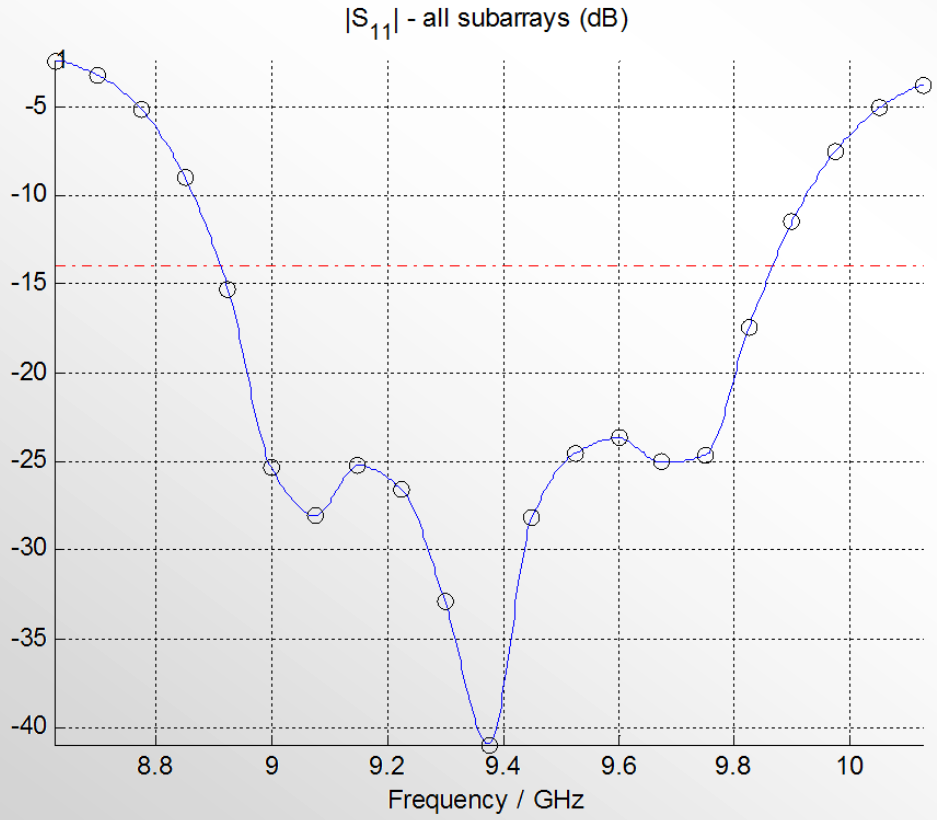
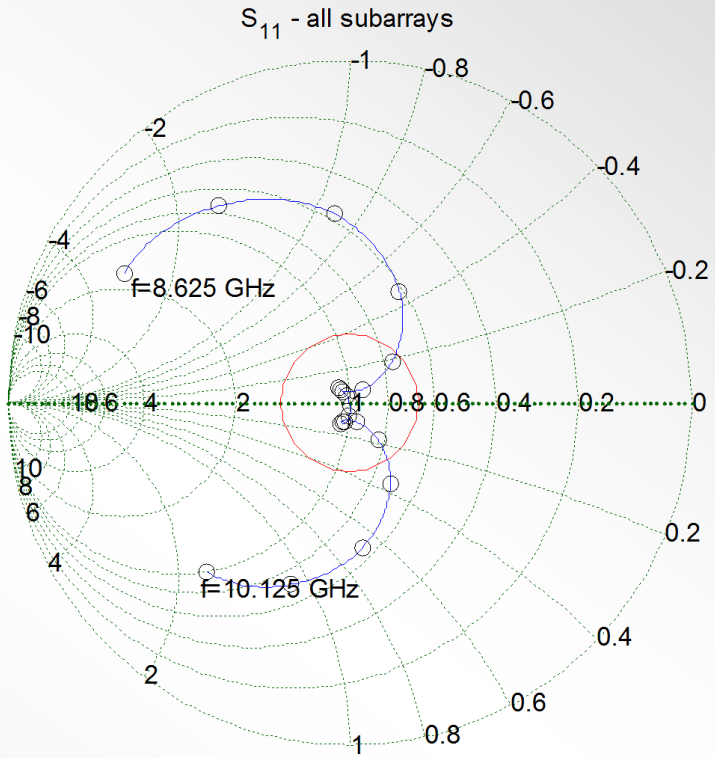
DESIGN

$Y_{in}=0.7$ → $Y_{sub}=1.428$

ANALYSIS

$Y_{in}=0.7$



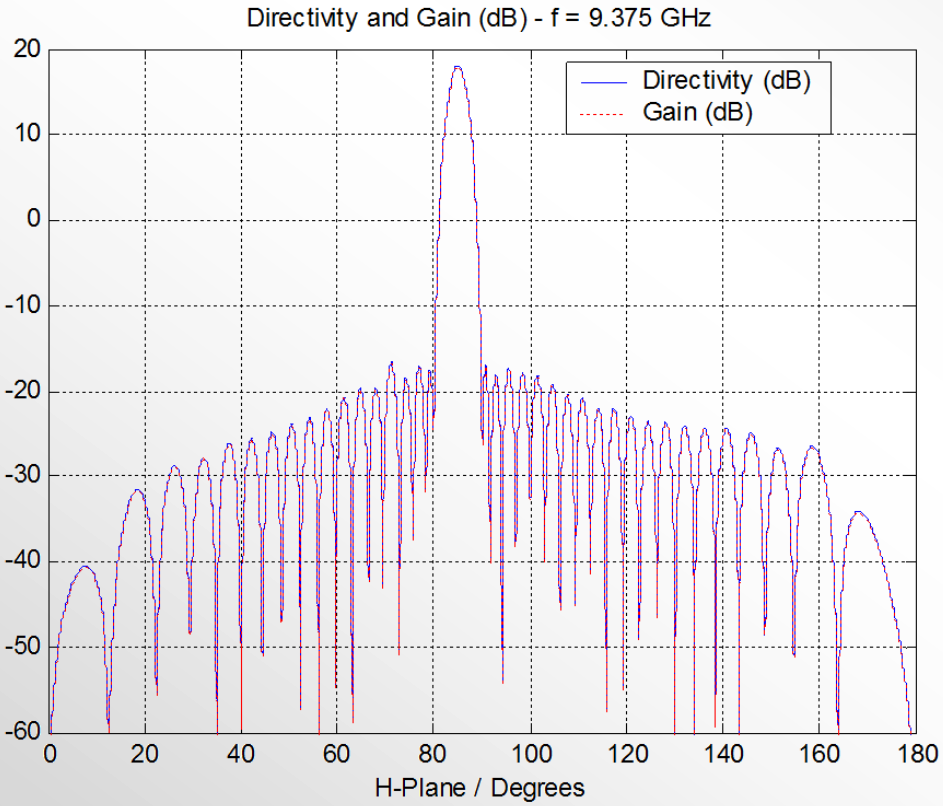


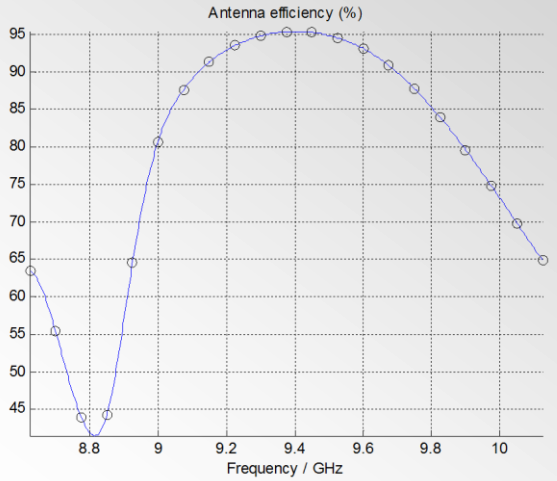
Example 2: Traveling wave – type 1

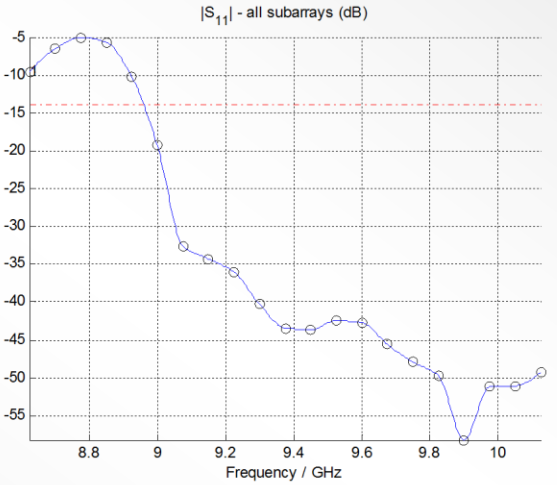
DESIGN

24×1, WR90, f_0=9.375GHz, SLR=35dB, ϑ_0=88°

Array mask:





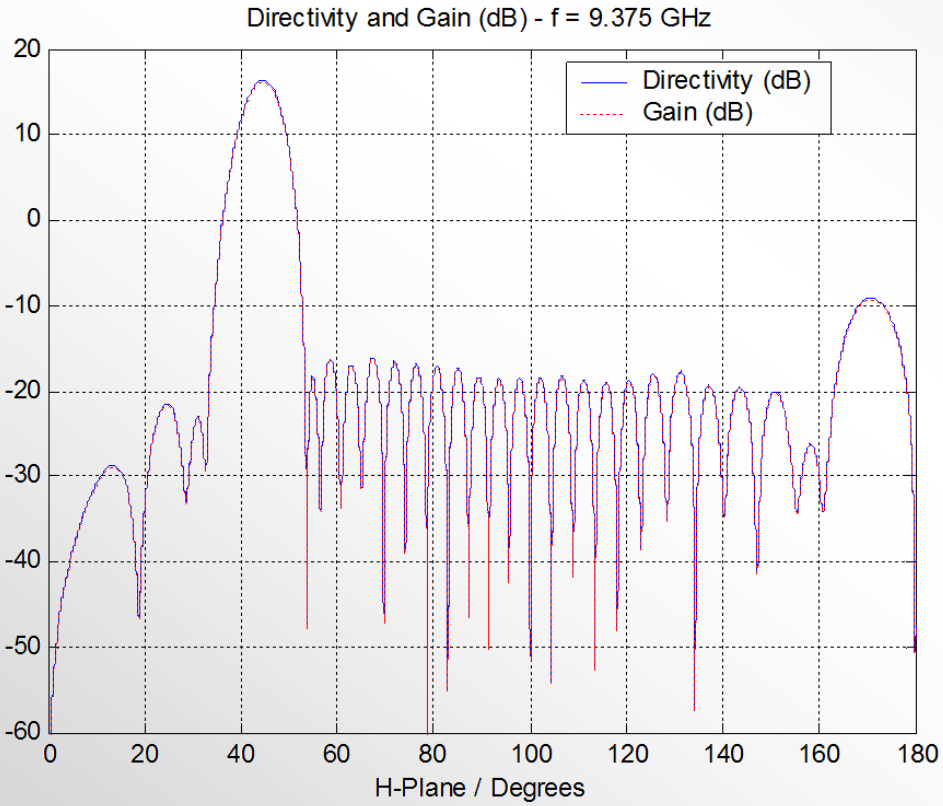


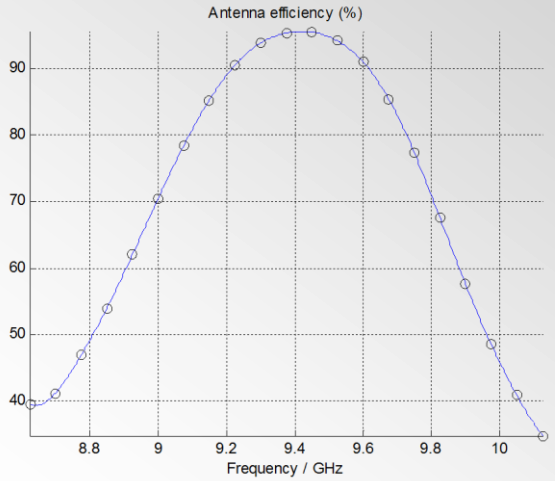
Example 3: Traveling wave – type 2

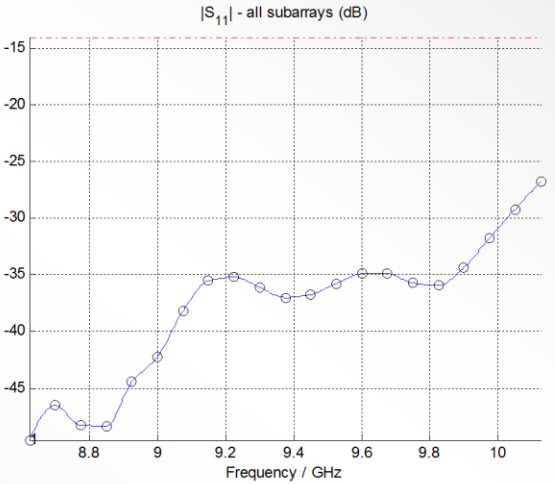
DESIGN

24×1, WR90, f_0=9.375GHz, SLR=35dB, L=0.4

Array mask:







Example 4: Cosecant pattern (1)

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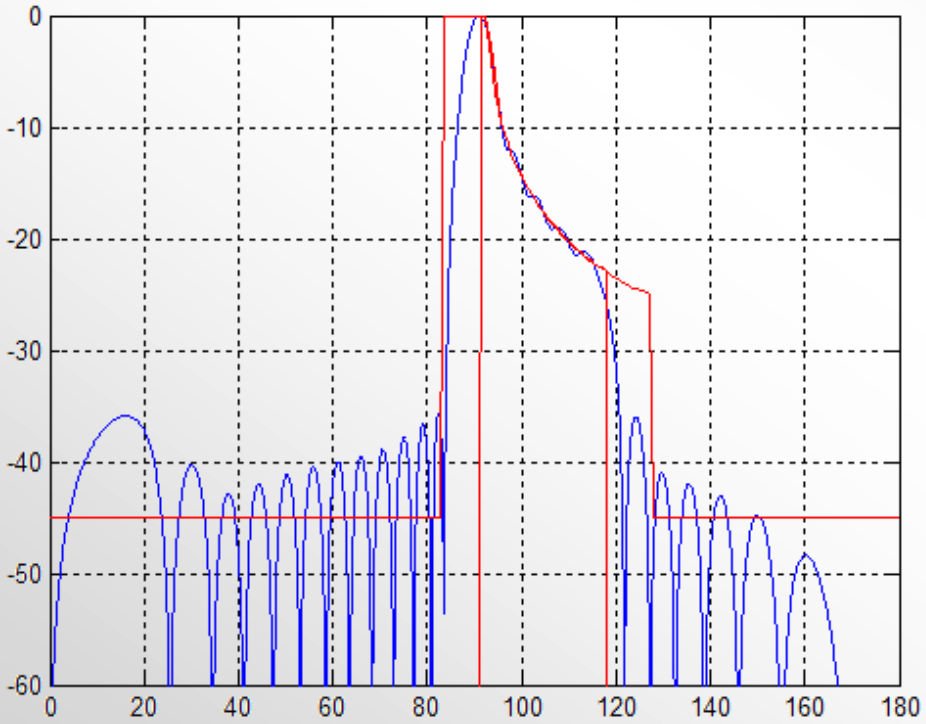
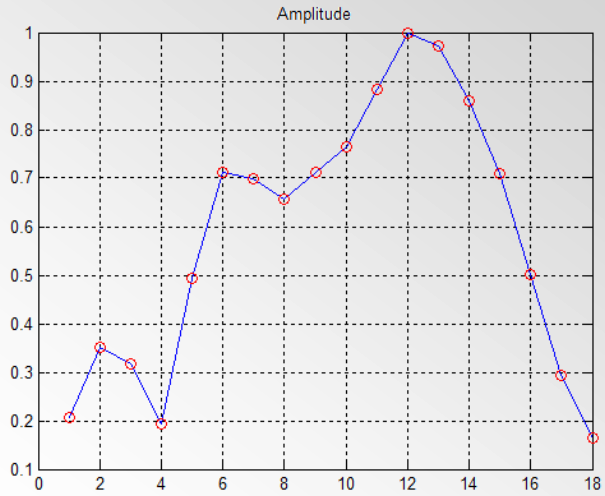
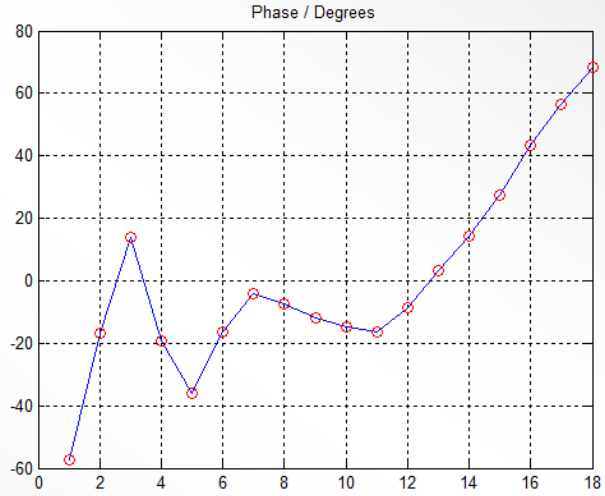
DESIGN

18×18, WR90, f0=9.375GHz, Centre feeding,
E-plane: Tayor, SLR=35 dB,
H-plane: Cosecant, $D_{min}/H=2$, $D_{max}/H=30$







Example 4: Cosecant pattern (2)

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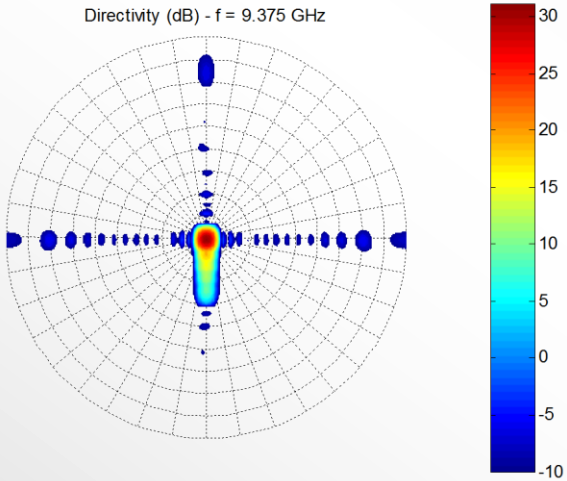
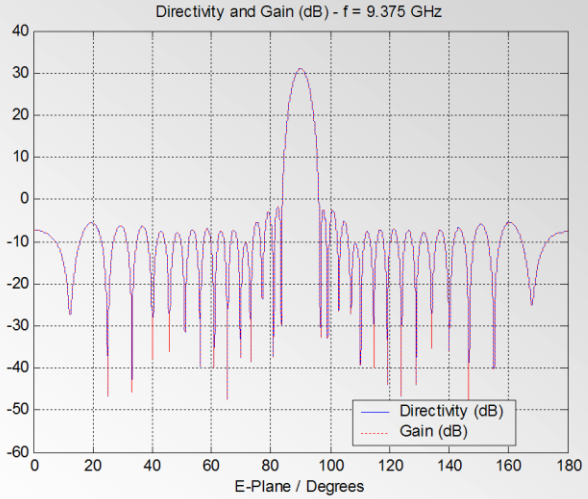
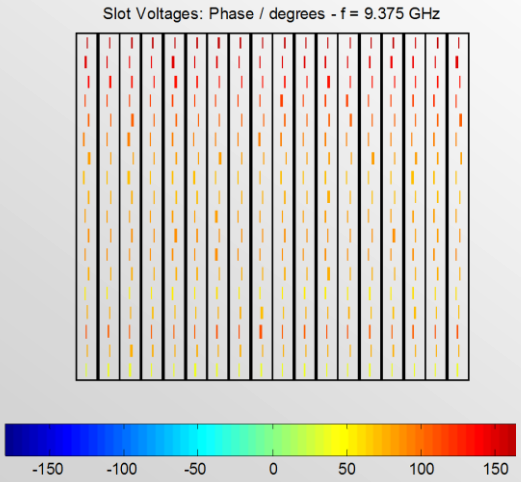
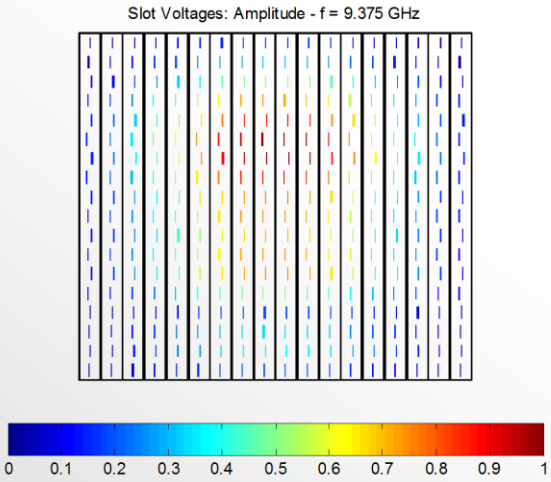
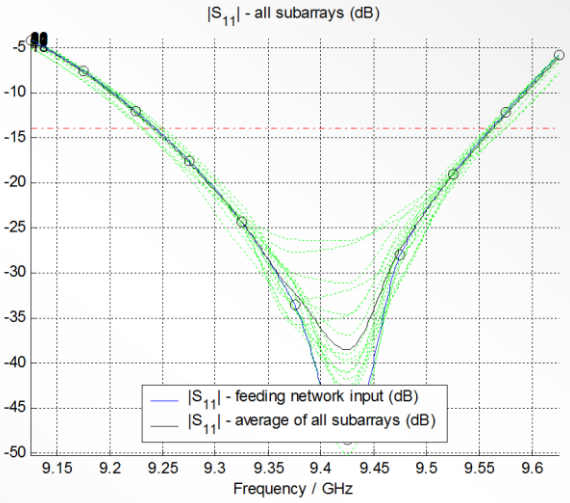






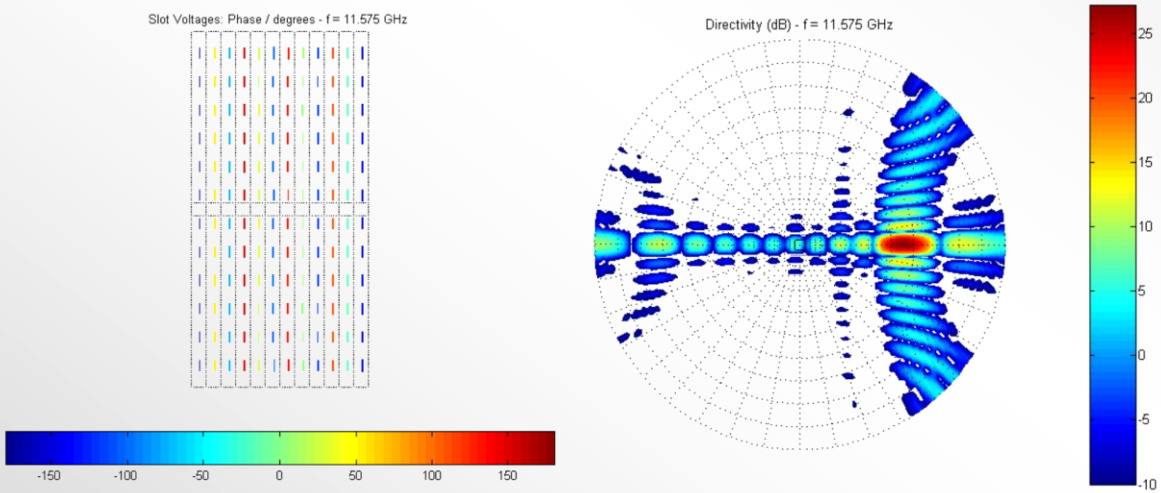


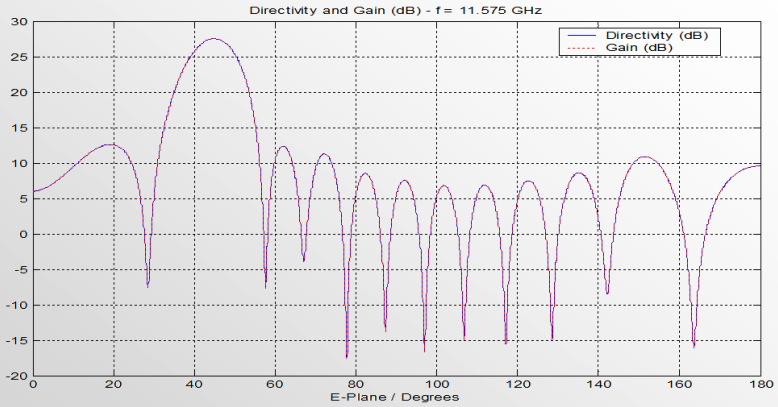


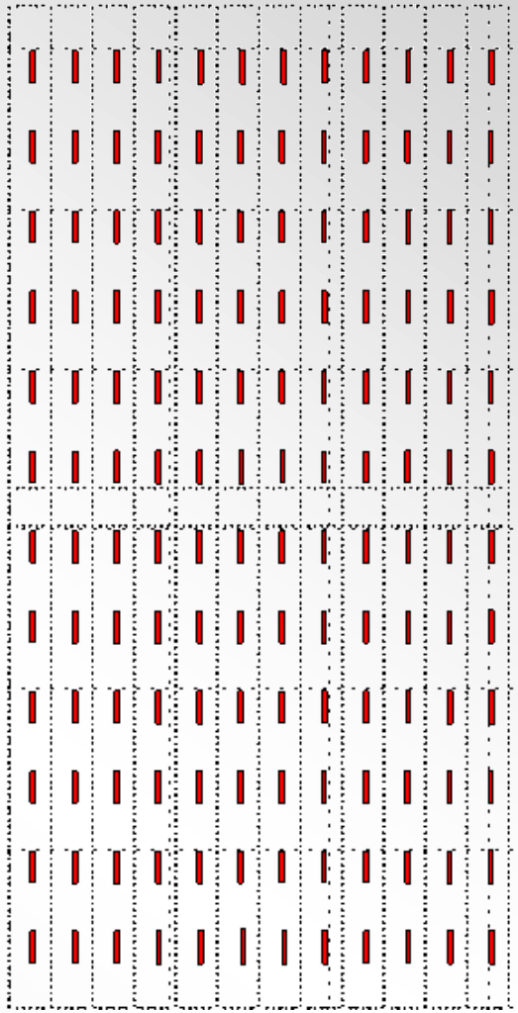
Example 5: Beam steering slotted SIW array

DESIGN

12×12, SIW (a/p/d = 13/2/1 mm), f0=11.575GHz,
Centre feeding, Beam pointing = 45° elevation



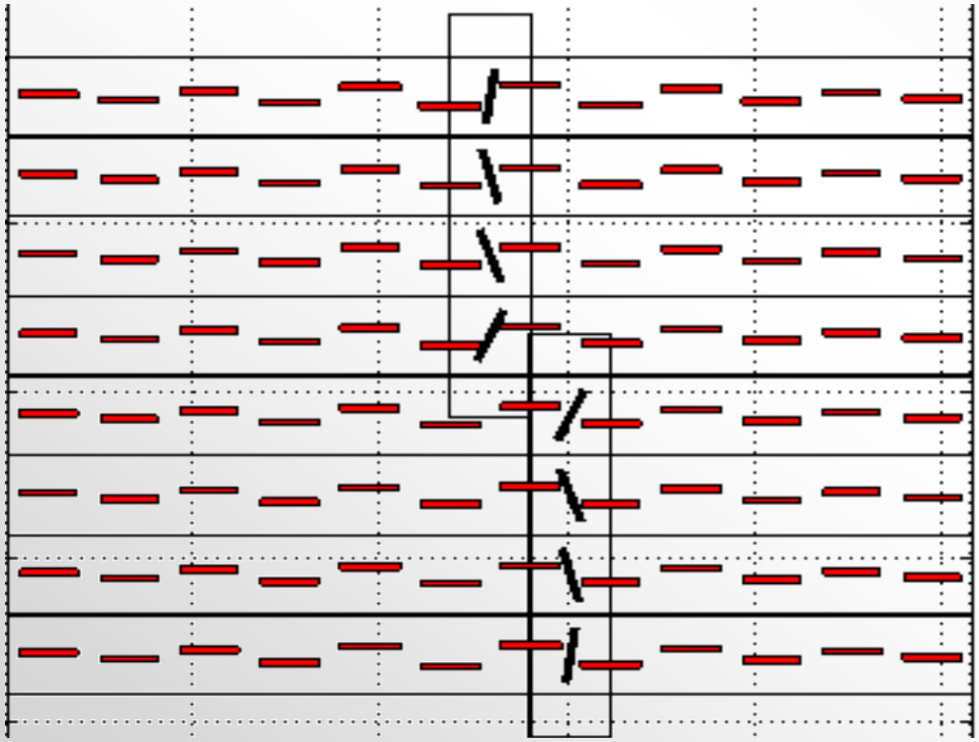


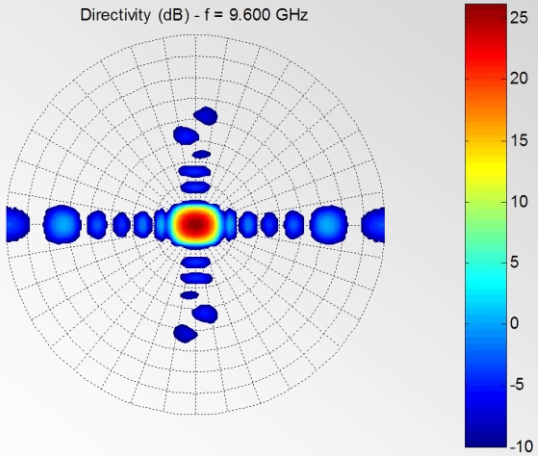


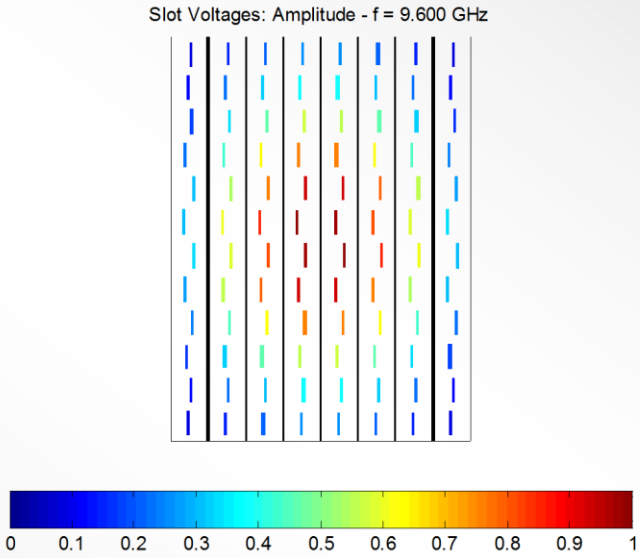
Example 6: Slotted waveguide BFN (1)

DESIGN

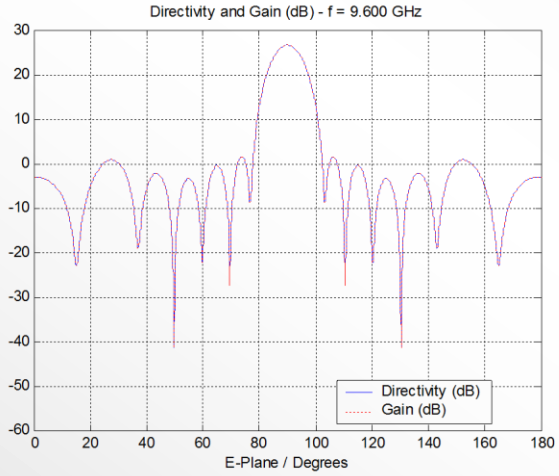
8×12, WG (a/b=22.86/5.08 mm), f0=9.6GHz,
Centre-fed, WG BFN divided into 2 sections,
E/H-plane: Tayor, SLR=30 dB,

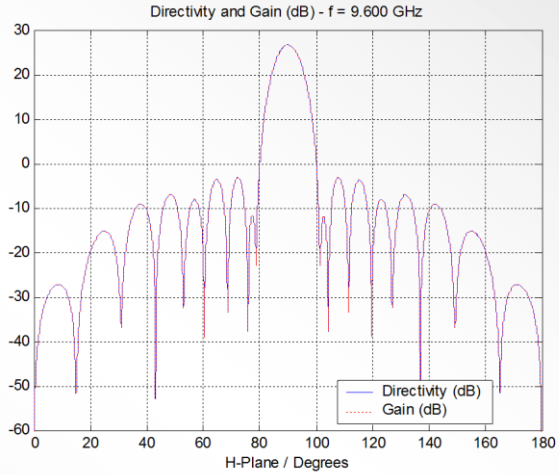


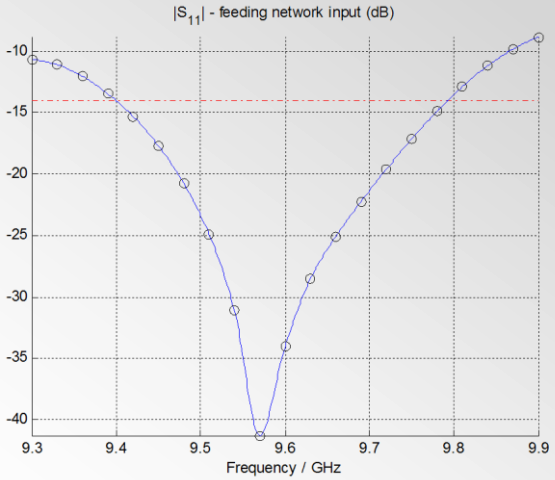


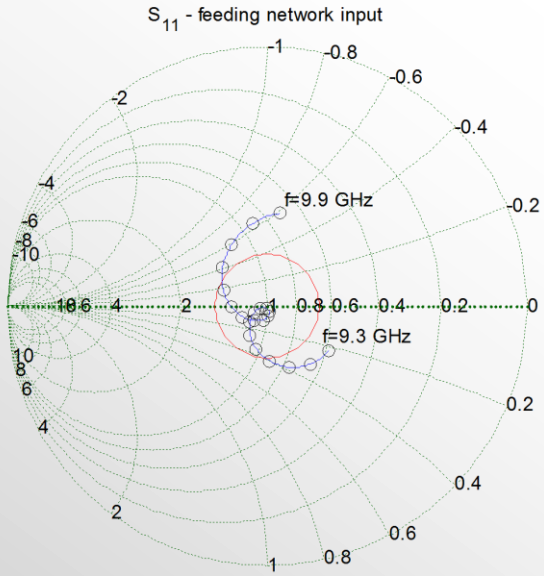


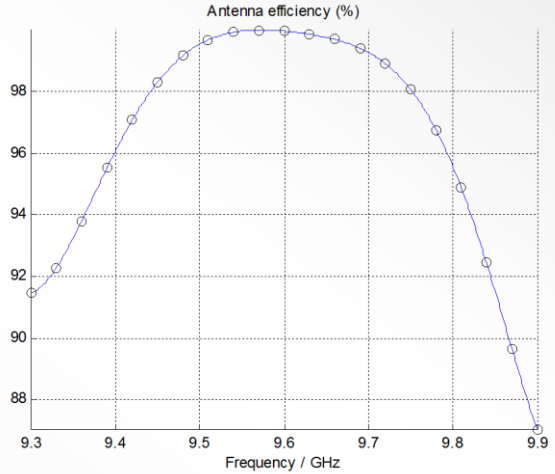
Example 6: Slotted waveguide BFN (2)











Example 7: Array divided in sub-sections

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DESIGN

18×18, WG (a/b=22.86/85.08 mm), f0=9.6GHz,
Centre-fed, WG BFN divided into 3 sections,
Slotted waveguide divided into 3 sections,
E/H-plane: Tayor, SLR=35 dB,